SERVICE MANUAL 115

marantz

model 115

Fm / Am Stereophonic Tuner

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1. INTRODUCTION

This service manual was prepared for use by Authorized Warranty Stations and contains service information for Marantz Model 115 Stereophonic Tuner.

Servicing information and voltage data included in this manual are intended for use by the knowledgeable and experienced technician only. All instruction should be read carefully. No attempt should be made to proceed without a good understanding of the operation in the receiver.

The part lists furnish information by which replacement part may be ordered from the Marantz Company. A simple description is included for parts which can be usually be obtained through local suppliers.

The Model 115 is a tuner version of the Marantz's Model 4430 Tuner/Amplifier and almost the same circuitry as used in the Model 4430 is employed except the audio Amplifier, and power supply circuit.

2. AM TUNER

All components except Tuning capacitor and ferrite bar antenna are mounted on a printed circuit board P150.

The AM signals induced in a ferrite bar antenna are applied to the base of RF amplifier transistor H151 through a capacitor of C151 and amplified to the level required for overcoming the conversion noises, thus giving good S/N performance. The tuned circuits inserted in both out- and in-put circuit of the RF amplifier assure very high image and spurious rejection performance. Thus amplified and selected AM signals are then applied to the base of converter transistor H152 through a coupling capacitor C156. While the local oscillator voltage is injected to the emitter of H152 through a capacitor C157. Both AM signals and oscillating voltage are mixed at the base-emitter junction and converted into 455KHz intermediate frequency. The resulting IF signal is applied to the first IF transformer L153 consisting of one ceramic filter and two tuned circuits.

The output of L153 is led to the transistor H153 which in turn apply its output to the transistor of next stage H154. The fully amplified IF output is then applied to the diode H157 to detect audible signal through the detector transformer L154. The detected audio signal is filtered and amplified and the final audio output is obtained from the collector of H155 and applied to the tape out jacks and the function switch.

The DC component of the detected IF signal is used as a AGC voltage to control emitter current of H153 which in turn control the bias current of the RF amplifier through the resistor R179 and R151. A part of IF signal output is also applied to the diode H158 through a capacitor C167 and rectified to obtain DC current for energizing the AM signal strength meter M001.

2.1 Suggestions for AM Tuner trouble shooting

Check for broken AM bar antenna, next try to tune station by rotating fly-wheel tuning knob slowly and observe the AM signal strength meter whether it deflects or not. If the signal strength meter gives a deflection at several frequencies received, no failure may exist in the stages at least preceding final IF transformer L154. Next connect a oscilloscope to the pin terminal J162 or J157 and check for audio signals with the tuning meter deflected. If the signal strength meter does not deflect, check the local oscillator circuit. Normal oscillating voltage at the hot end of the oscillator tuning capacitor is about 2 or 3 volts, varying with tuning capacitor position. When measuring oscillating voltage use a RF VTVM, no circuit tester gives correct indication. If the local oscillator voltage is normal, check all voltage distribution in the AM circuits by using a DC VTVM and compare the measured values with those given in the schematic diagram.

3. FM TUNER

The FM Tuner section of Model 115 is divided into four functional blocks: FM Front End, IF Amplifier and Detector, Muting Control and MPX Stereo Decoding Circuit.

FM signals induced by a FM antenna are led to FM antenna coil L101 through an attenuator

switch and a balun coil. These signals are then applied to the FET RF amplifier which in turn applies its output to the next FET Mixer H102 through the double tuned high selective circuits. The FET Mixer convert its input signal into 10.7MHz intermediate frequency and amplifies it at the same time. The H103 is a local oscillator and its output is injected into the source of the FET Mixer, the injection voltage is about 700mV. The 10.7MHz front end output is led to the next IF amplifier unit through a coaxial cable.

The IF amplifier unit consists of five stages of IF amplifier and one stage of AGC amplifier. Three pieces of dual elements ceramic filters are also used to obtain high selectivity, four stages of symmetrical diode limiters are also employed for the best limitting characteristics, improved capture ratio and good AM suppression.

A part of FM Front End output is applied to the AGC amplifier H201 and rectified its output is fed back to the gate of FET RF amplifier to decrease the gain with increased signal strength.

The IF signal sufficiently amplified through every stage of IF amplifier is finally applied to the Transistor limiter. The detected audio output is led to the buffer amplifier H208 and its buffered output is led to; (a) noise amplifier H471 through resistor R471 and capacitor C471, (b) Quadradial Jack on the rear panel through resistor R484, (c) MPX stereo decoding circuit through R483.

3.1 Audio Muting and Stereo mode auto-selecting circuit

The muting circuit consisting of all solid-state electrical switching has been incorporated in the Model 115. Three inputs control the muting function. The first is related to signal strength, the second to the noise condition at the detector and the third is derived from the DC component of the detector output. These inputs are properly matrixed and gated to provide muting free from noise and transients.

The first input of DC voltage obtained by rectifying a part of IF output signal from the H206 is applied to the base of H306 and turns on it, if the IF output is greater than predetermined level (muting threshold level). When the H306 is turned on the H307 is turned off, allowing the emitter-collector resistance increasing and the collector voltage rises about 9V. The increased collector voltage increases the gate bias voltage and turns on the switching FET H308, decreasing the source-drain resistance to near zero ohm and allowing the audio signal applied to the source to flow to the center of 38KHz switching transformer through the source-drain path.

When the input signal is lower than predetermined level, the DC output obtained is small and can not turn on the H306, thus the H306 keeps its turn-off stage and this makes H307 turn on, decreasing the collector voltage and turning off H308. Thus no audio signals can pass through the FET. This is the fundamental principle of the muting operation but for more elaborate muting operation the second and the third inputs are necessary.

The second input is used to protect the muting operation and MPX stereo beacon lamps from misoperation due to undesirable noises. The high frequency noises included in the detected audio signals are separated by a small capacitor C471 and amplified by the noise amplifier transistor H471 and its output is rectified by the two diodes. The rectified DC output is proportional to the noise components in the audio signals.

When there are excessive noises in the audio signals such as obtained with a station incorrectly tuned in, the rectified DC output turns on the transistor H472, decreasing the emitter-collector resistance to zero. This means the collector of H307 is short-circuited to the ground, therefore the H308 is turned off and any audio signals having excessive high frequency noises can not go through the FET's source-drain path.

The transistor H303 connected in series with the 19KHz pilot signal amplifier transistor H302 is also turned off (when the transistor H472 or H307 are turned on.) and no current flows in the H302, resulting in turning off the stereo beacon lamps. Thus misoperation due to undesirable noises is also avoided.

The third input is obtained from the FM discriminator circuit. The DC output so called "S" curve is applied to the gate of H478 through a resistor R273 and deviding network (R485 &

R486). The DC output is zero with a station correctly tuned in, but will vary from negative to positive values or vice versa when the tuning point is deviated toward either plus or minus frequency from the correct tuning frequency.

When the DC output is increased to a greater level than that of predetermined, the increased source potential of H478 makes the transistor H481 turn on, and this makes the H306 turn off, ... H307 turn on, ... H308 turn off, ... H303 turn off (this means no 19KHz pilot signal is amplified and no stereo beacon is turned on.) When the DC output is increased to the negative predetermined level, the decreased source potential turns off the H479 which in turn makes the H480 turn on and the H306 in turned off. The subsequent changes are exactly the same as that just described above.

Thus when the tuning is shifted or deviated to the certain frequencies in which undesirable noisy side-audio signals are produced, both muting and 19KHz switching transistors are operated automatically and open the circuits.

With the station correctly tuned in, the bias current of the FET H478 is adjusted so that both transistor H480 and H481 are not turned on, giving no effect on the transistor H306.

3.2 MPX Stereo Decoding Circuit

The buffered and non-equalized audio signals are applied to the first amplifier H301 which serve as a tuned amplifier for the pilot signal in the composite signals and as a buffer amplifier for the audio signals. The amplified 19KHz pilot signal is led to the second 19KHz amplifier H302 and further amplified if switching transistor H303 is turned on by the controlling DC signal as described in the preceding chapter. The final 19KHz pilot signal is rectified by the doubler circuit consisting of the H315 and H316 to obtain synchronized 38KHz amplifier driving signal.

The H304 is the 38KHz tuned amplifier and supplies its output to the switching matrix circuit consisting of four diodes. While the composite signals are applied to the center tap of switching transformer 1/2 L302. The right and left stereo signals decoded by the switching circuit are led to the crosstalk cancelling amplifier which utilizes complementary configuration with NPN and PNP transistors through de-emphasis network consisting of C315 and R335, and C316 and R336. L305 is a low-pass filter networks having very sharp cut off characteristics and eliminates undesirable residual switching signals. Transistors H313 and H314 are buffer amplifiers and their outputs are led to the function switch.

3.3 Suggestion for Trouble Shooting of FM Tuner

3.3.1 Symptom: No FM Reception

First turn on the Power switch and try to tune FM stations. Rotate the fly-wheel tuning knob slowly and observe the FM signal strength meter. If the signal strength meter deflect at several frequencies received, the tuner circuits preceding the discriminator circuit may have no failure. When no reading is obtained in the meter, check FM local oscillator circuit, using a RF VTVM. The normal local oscillator voltage is one or two volts (rms) at the tuning capacitor, depending on the tuning capacitor position. If the local oscillator voltage is normal, next check all voltage distribution in the FM Front End and IF amplifier unit and compare them with those shown in the circuit diagram. When signal strength meter deflects but no sound is obtained, check audio circuits, using high sensitive oscilloscope.

3.3.2 Symptom: No Stereo Separation

First check the "MONO" switch is in normal out position. Connect a FM RF signal generator output modulated by a stereo modulator to the rear FM antenna terminals, and check the stereo beacon is turned on or not. If not turned on, check for 19KHz pilot signal and 38KHz switching signal, using an oscilloscope.

4. AM ALIGNMENT PROCEDURE

4.1 AM IF Alignment

1. Connect a sweep generator to the J151 and an alignment scope to the J162.
2. Rotate each core of IF transformer L153 and L154 for maximum height and flat top symmetrical response.

4.2 AM Frequency Range and Tracking Alignment

1. Set AM signal generator to 525KHz. Turn the tuning capacitor fully closed (place the tuning pointer at the low end.) and adjust the oscillator coil L152 for maximum audio output.
2. Set the signal generator to 1650KHz. Place the tuning pointer in the high frequency end and adjust the oscillator trimmer on the oscillator tuning capacitor for maximum audio output.
3. Repeat the step 1 and 2 until no further adjustment is necessary.
4. Set the generator to 600KHz and tune the receiver to the same frequency and adjust a slug core of AM ferrite rod antenna and RF coil L151 for maximum output.
5. Set the generator to 1400KHz and tune the receiver to the same frequency and adjust both trimming capacitors of Antenna and RF tuned circuit for maximum output.
6. Repeat the step 4 and 5 until no further adjustment is necessary.

Note: During tracking alignment reduce the signal generator output as necessary to avoid AGC action.

5. FM ALIGNMENT PROCEDURE

1. Connect a FM signal generator to the FM antenna terminals and a oscilloscope and an audio distortion analyzer to the tape output jacks on the rear panel.
2. Set the FM SG to 87.5MHz and provide about 3 to 5μV. Place the tuning pointer at the low frequency end by rotating the tuning knob and adjust the core of oscillator coil L104 to obtain maximum audio output.
3. Set the FM SG to 108.5MHz and provide about 3 to 5μV output. Rotate the tuning knob and place the tuning pointer at the high frequency end and adjust the trimming capacitor C106 for Maximum output.
4. Repeat the step 2 and 3 until no further adjustment is necessary.
5. Set the FM SG to 90MHz and tune the receiver to the same frequency. Decrease signal generator output until the audio output level decreases with the decreasing generator output. Adjust the antenna coil L101, RF coil L102 and L103 and IF transformer L105 for minimum audio distortion.
6. Set the FM SG to 106MHz and tune the receiver to the same frequency. Adjust the trimming capacitor C102, C104 and C105 for minimum distortion.
7. Adjust the secondary core (upper) of discriminator transformer L201 so that the center tuning meter pointer indicates its center at no signal applied. Set the FM SG to 98MHz and increase its output level to 1KμV and tune the receiver to the same frequency so that the center tuning meter pointer indicates its center. Adjust the primary core (lower) of L201 for minimum distortion.

5.1 Stereo Separation Alignment

1. Set the FM SG to provide 1KμV at 98MHz. Tune the receiver to the same frequency so that the center tuning meter pointer indicates its center.
2. Modulate the FM SG with stereo composite signal consisting of only subchannel signal (of course a pilot signal must be included). Adjust the core of L301 for maximum audio output, then, modulate the signal generator with a stereo composite signal consisting of only L channel signal and again adjust the core of L301 for maximum audio output.
3. Adjust the trimming resistor R365 for maximum and same separation in both channels.

5.2 Muting Circuit Alignment

1. Connect a VTVM across the resistor R487 and adjust the resistor R487 until the meter reads 0.75V DC at no signal.
2. Set the FM SG to provide 1 KμV at 98 MHz and tune the receiver to the same frequency correctly.
3. Turn on MUTING push-switch. Shift the FM signal generator frequency to plus and minus and note both plus and minus shifted frequencies at which undesirable audio side responses are muted out. Adjust the R487 so that the same shifted frequencies mute the undesirable side response.

6. TEST EQUIPMENT REQUIRED FOR SERVICING

Table 1 lists the test equipment required for servicing the Model 115 Tuner.

Item	Manufacturer and Model No.	Use
AM Signal Generator		Signal source for AM alignment
Test Loop		Used with AM Signal generator
FM Signal Generator	Less than 0.3% distortion	Signal source for FM alignment
Stereo Modulator	Less than 0.3% distortion	Stereo separation alignment and trouble shooting
Audio Oscillator	Weston Model CVO-100P, less than 0.02% residual distortion is required.	Sinewave and squarewaves signal source.
Oscilloscope	High sensitivity with DC horizontal and vertical amplifiers.	Waveform analysis and trouble shooting, and ASO alignment.
VTVM Circuit Tester	With AC, DC, RF range	Voltage measurements. Trouble shooting

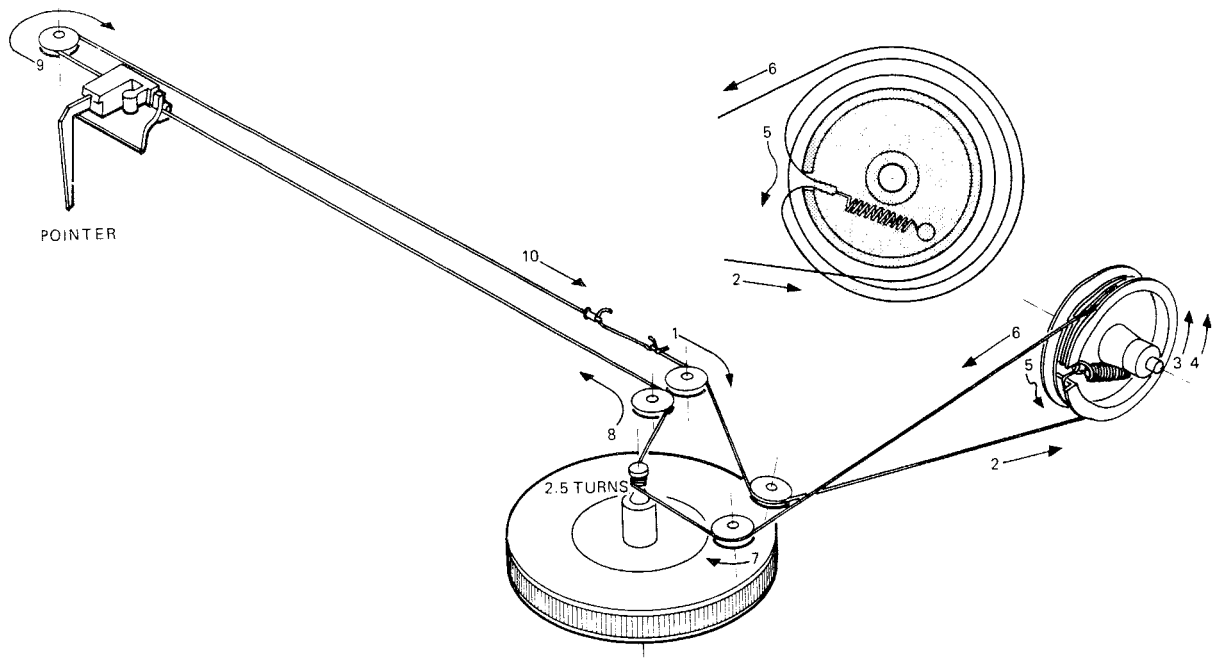

Figure 1. Dial Stringing

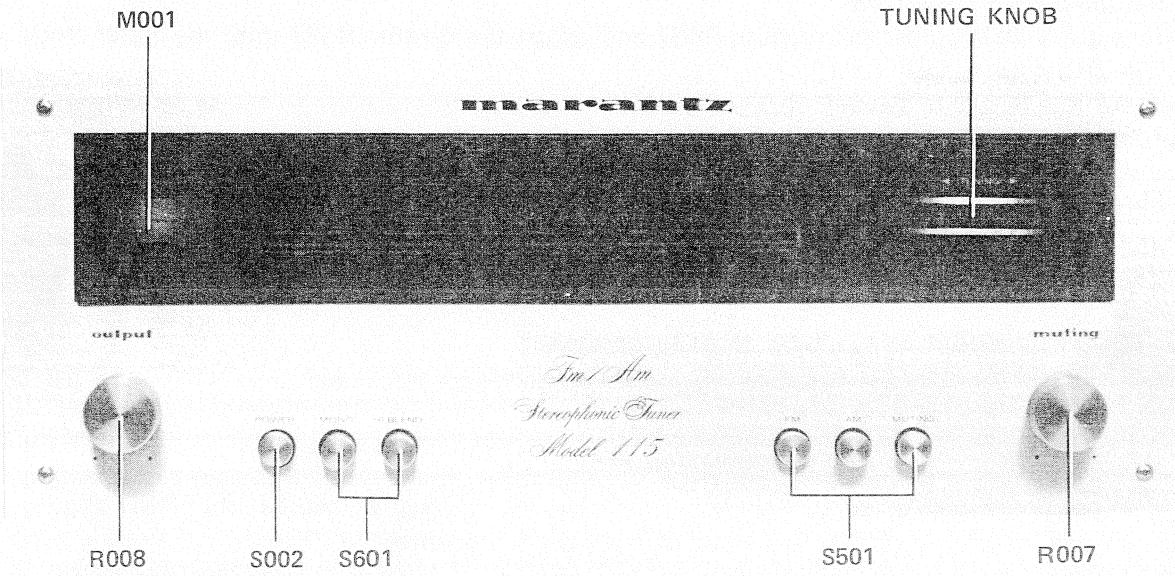

Figure 2. Front Panel Adjustment and Component Locations

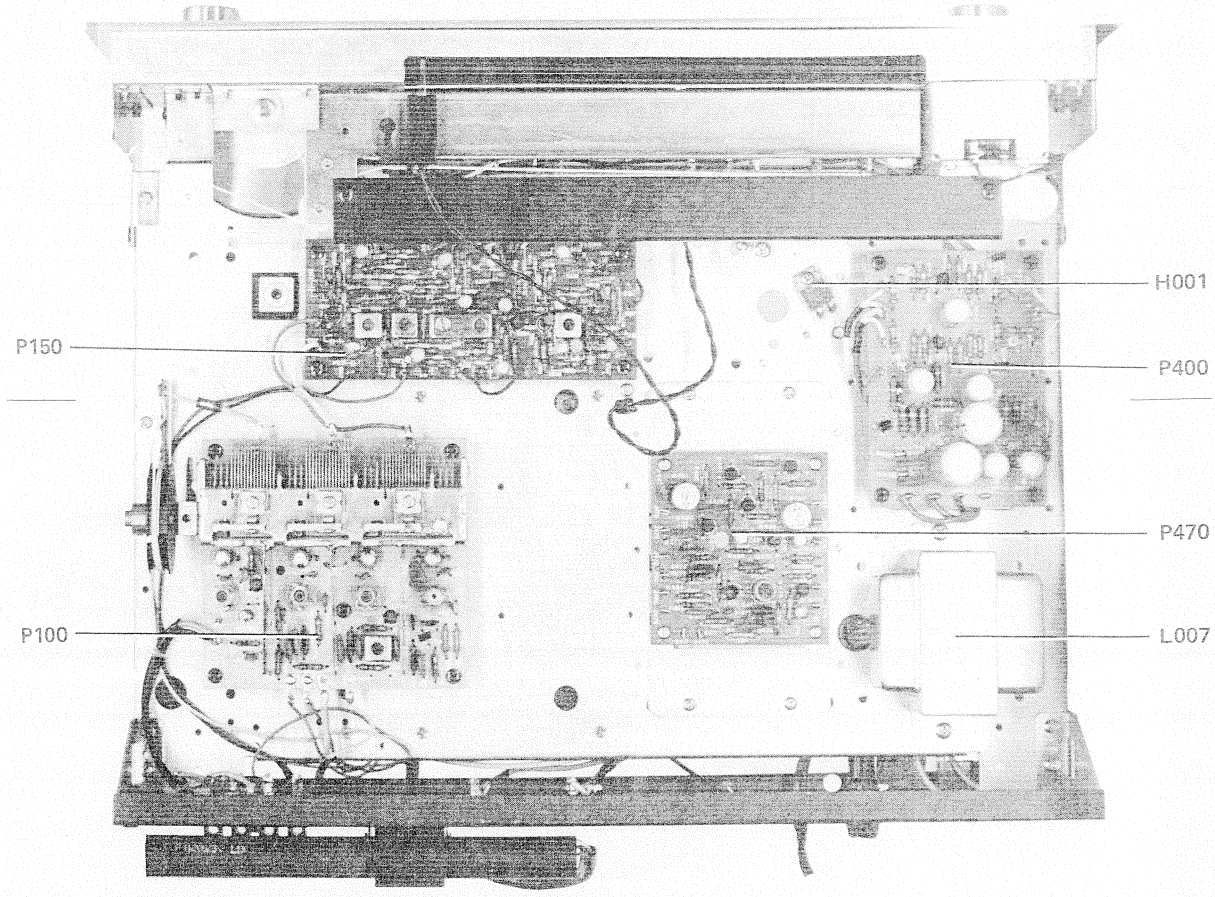

Figure 3. Main Chassis Component Locations (Top View)

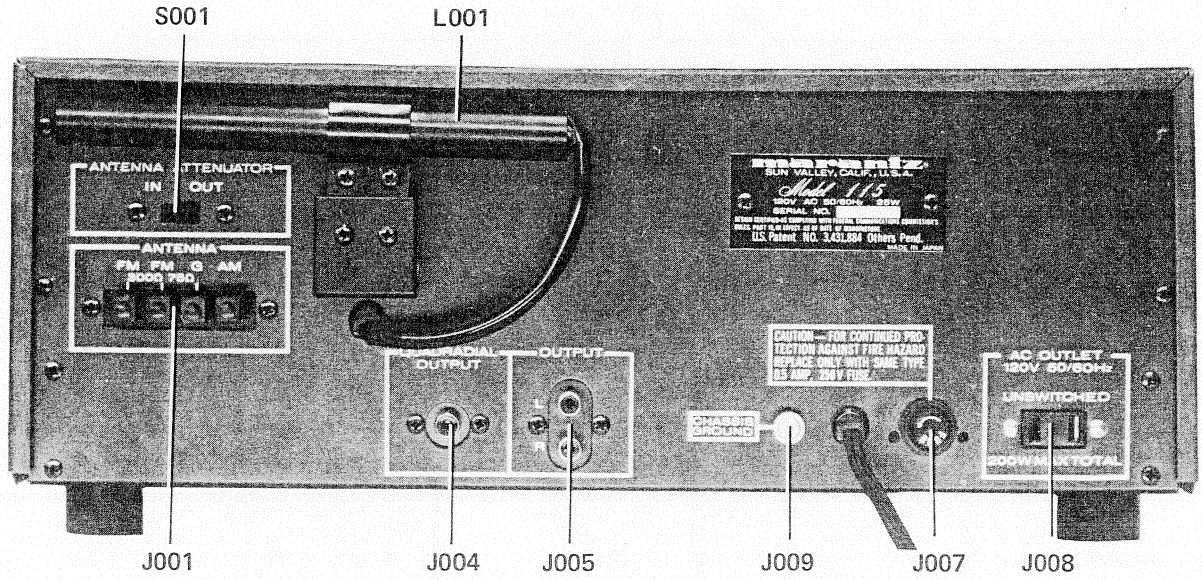

Figure 4. Rear Panel Adjustment and Component Locations

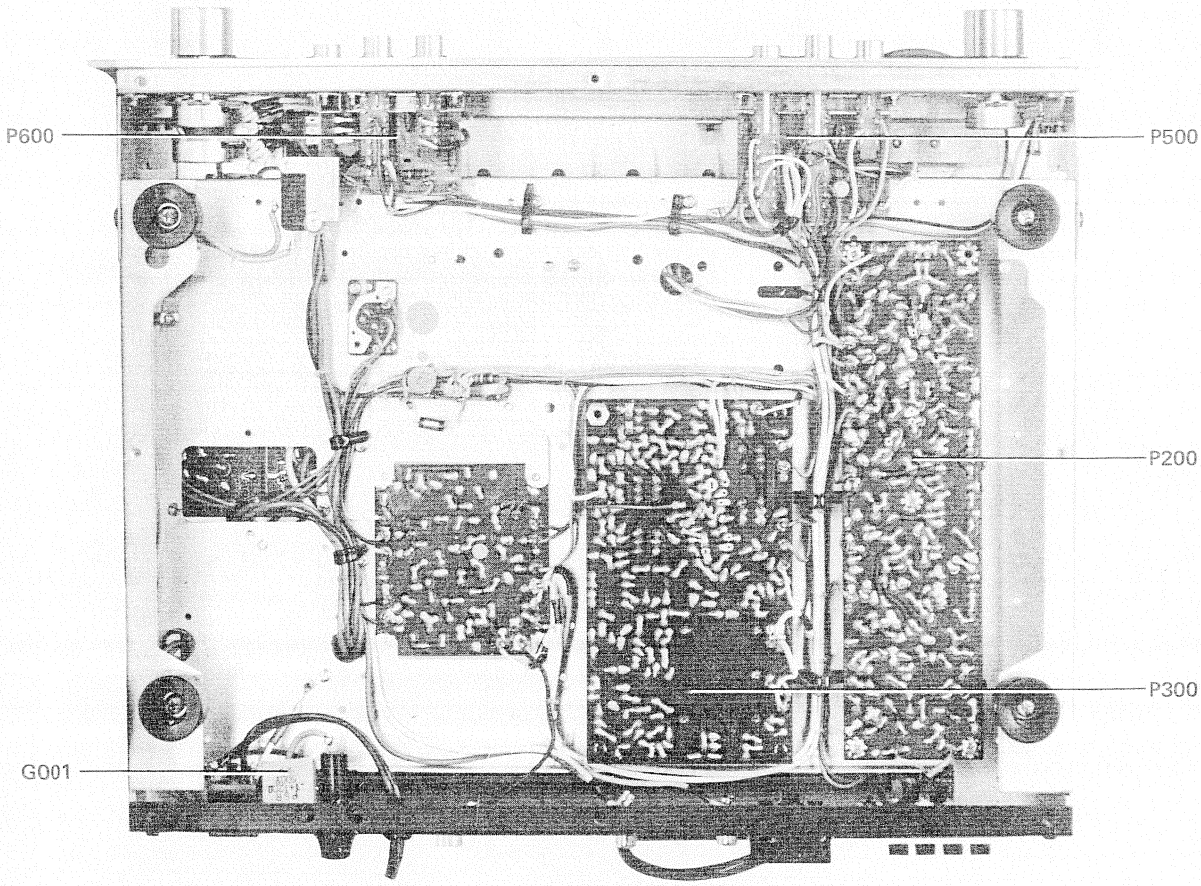

Figure 5. Main Chassis Component Locations (Bottom View)

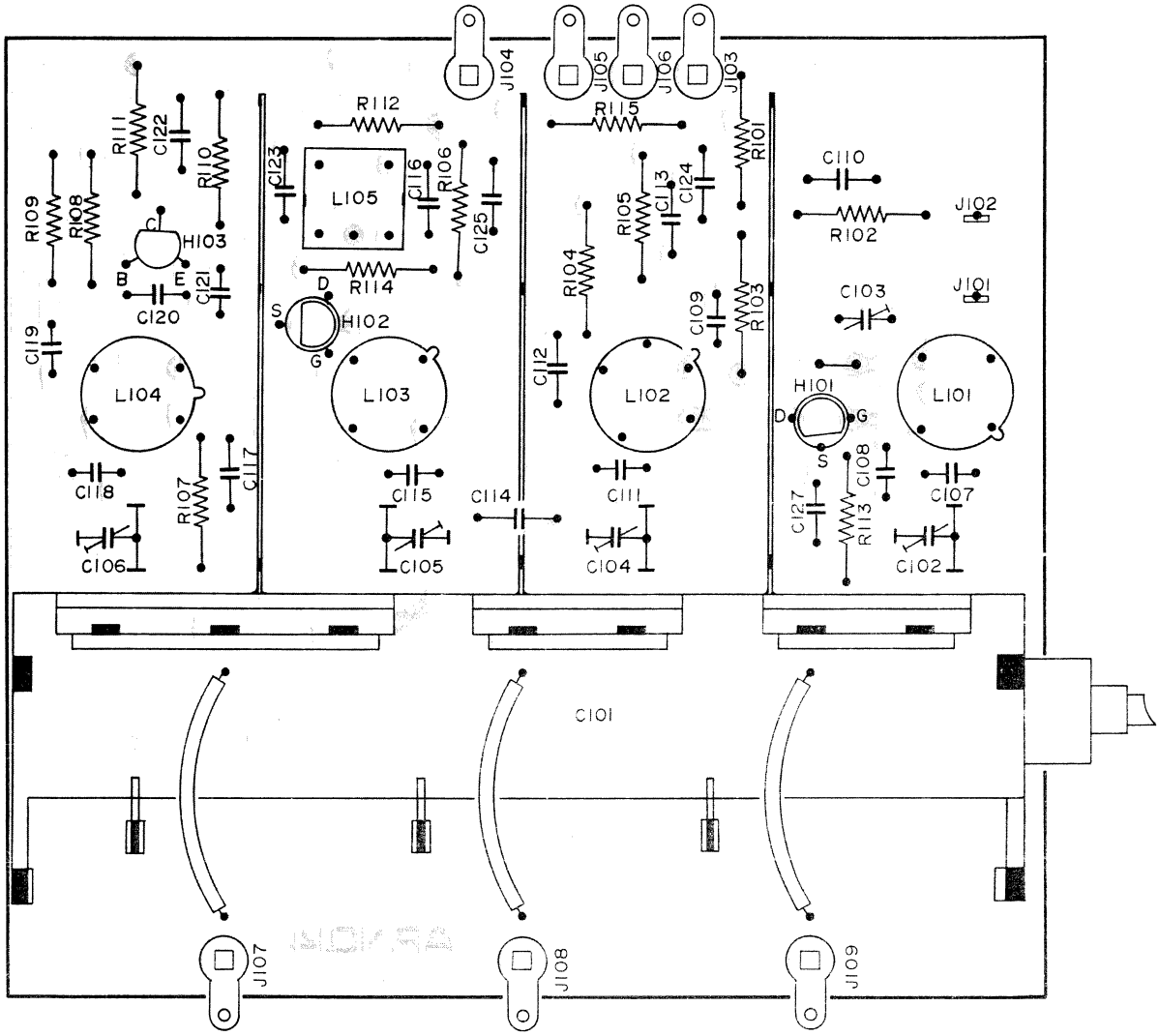

Figure 6. FM Front End Assembly P100 Component Locations

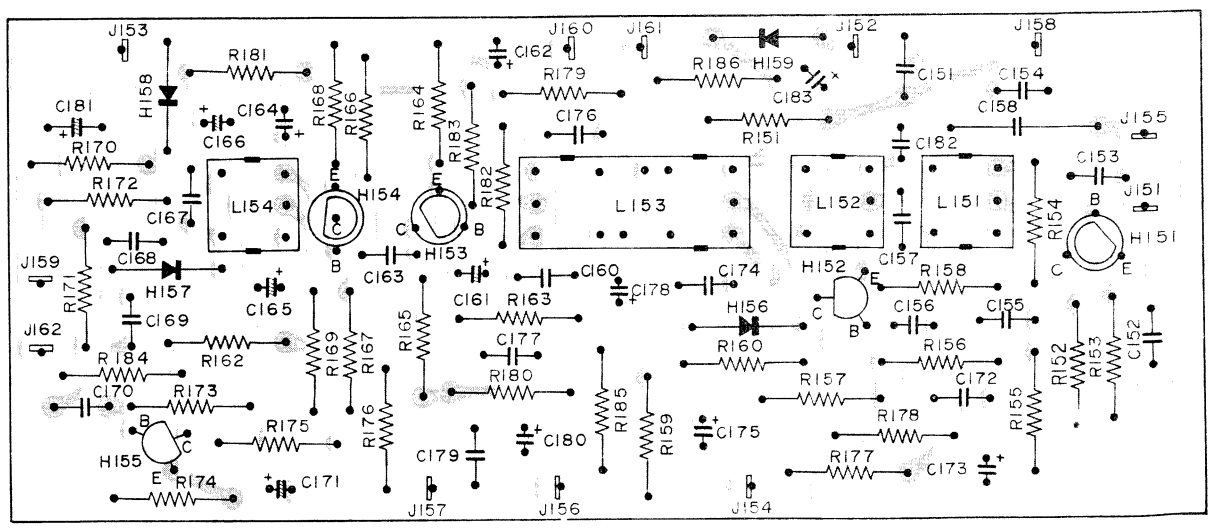

Figure 7. AM Tuner Unit Assembly P150 Component Locations

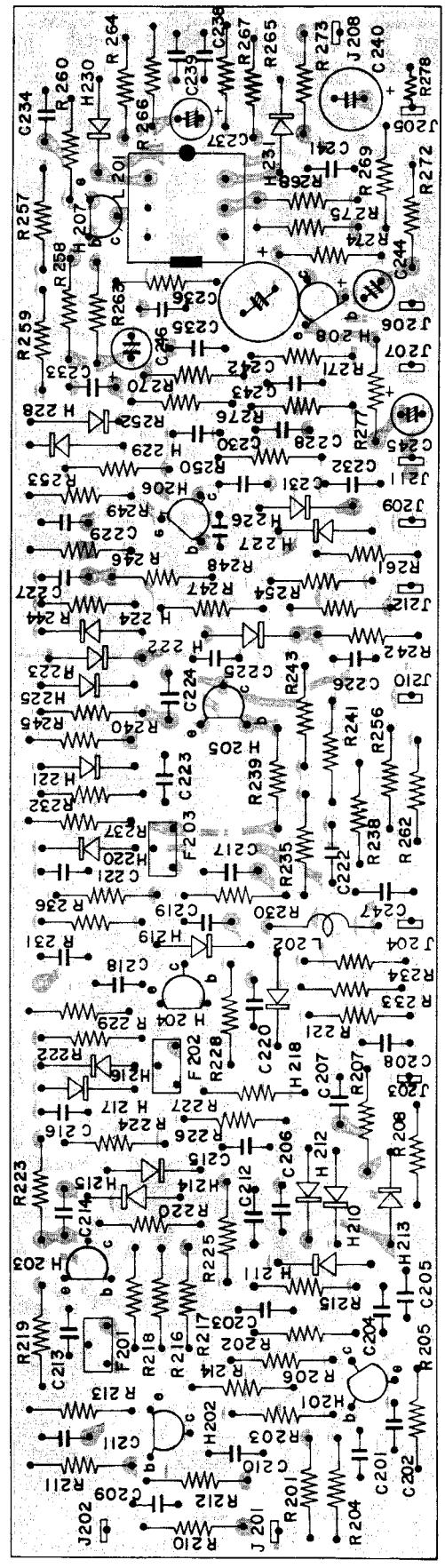

Figure 8. FM IF Amplifier Assembly P200 Component Locations

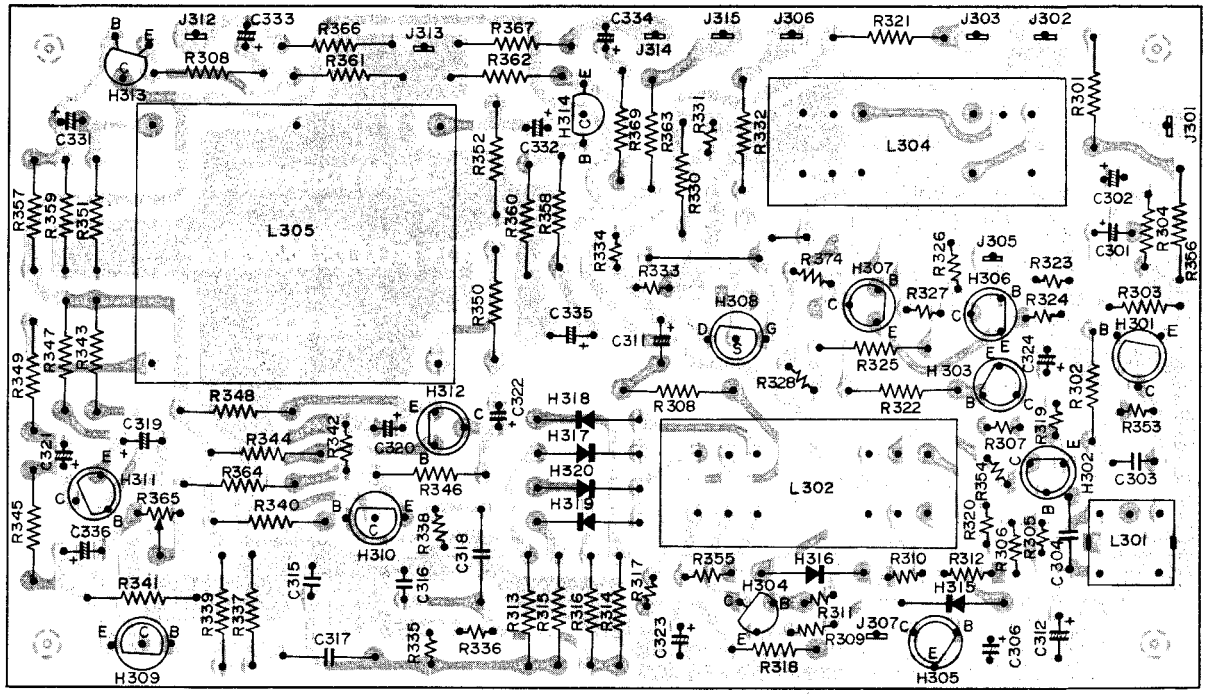

Figure 9. MPX Stereo Decoding Amplifier Assembly P300 Component Locations

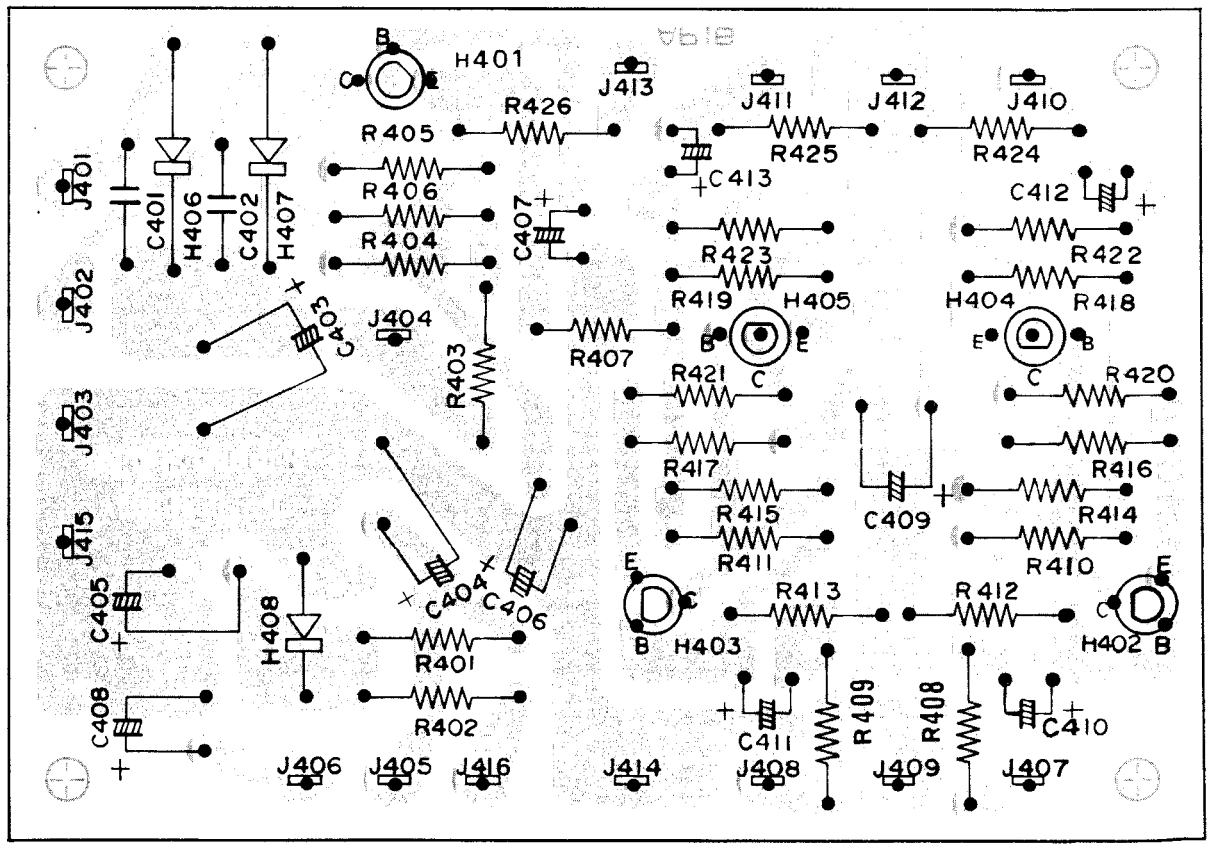

Figure 10. Pre-Amplifier and Power Supply Assembly P400 Component Locations

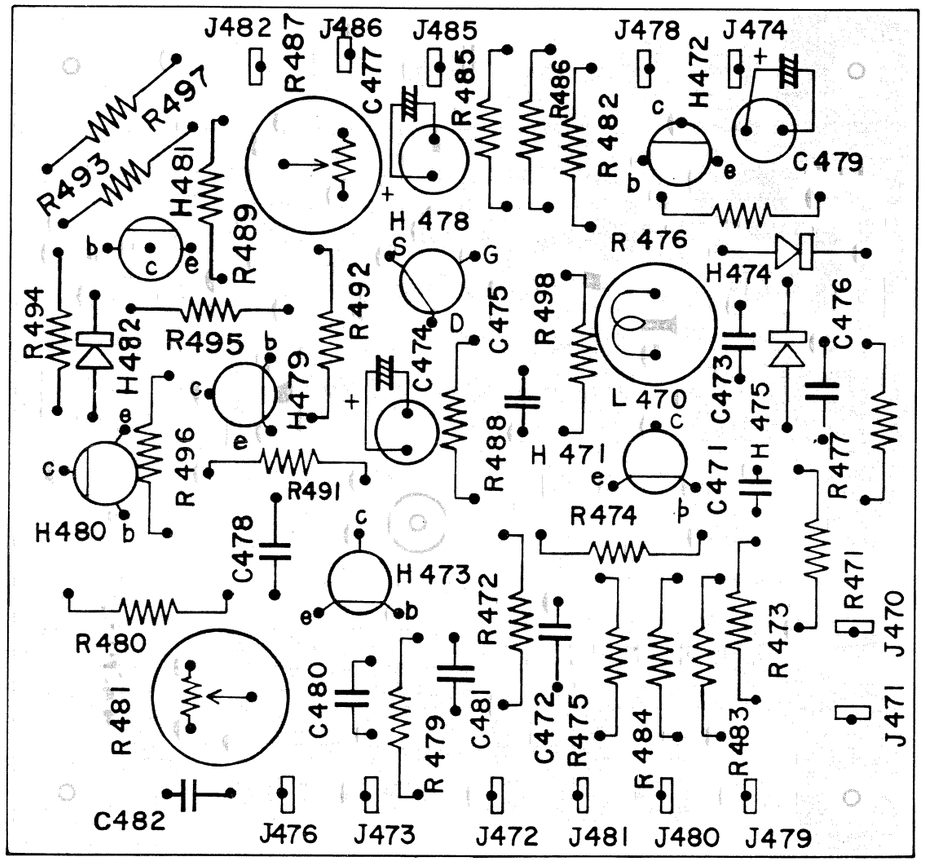

Figure 11. Noise and DC Amplifier Assembly P470 Component Locations

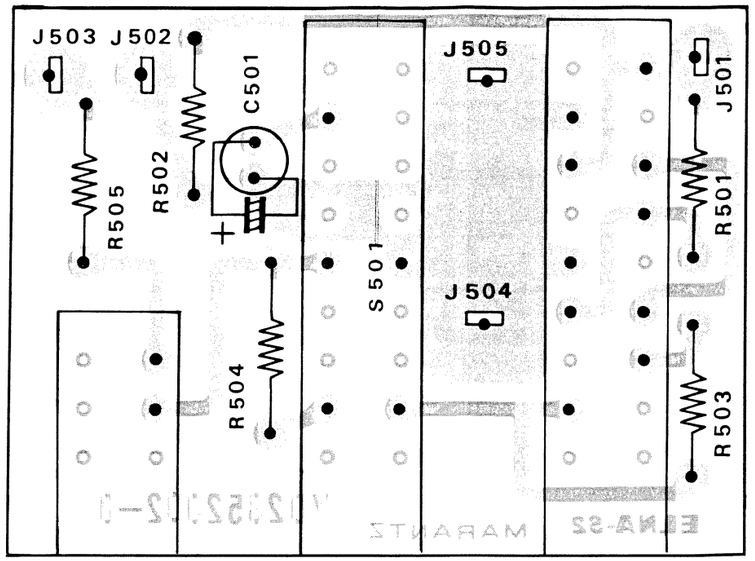

Figure 12. FM, AM and Muting Switch Assembly P500 Component Locations

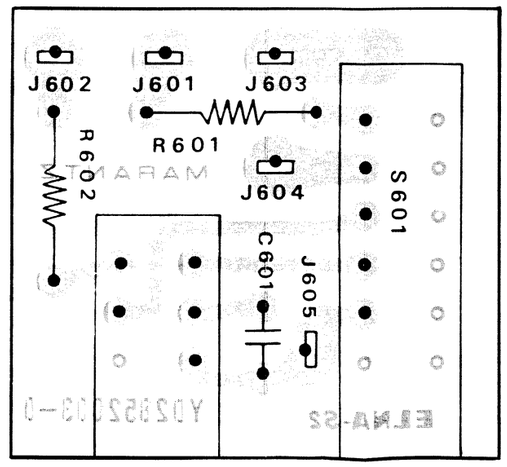

Figure 13. Mono and Hi Blend Switch Assembly P600 Component Locations

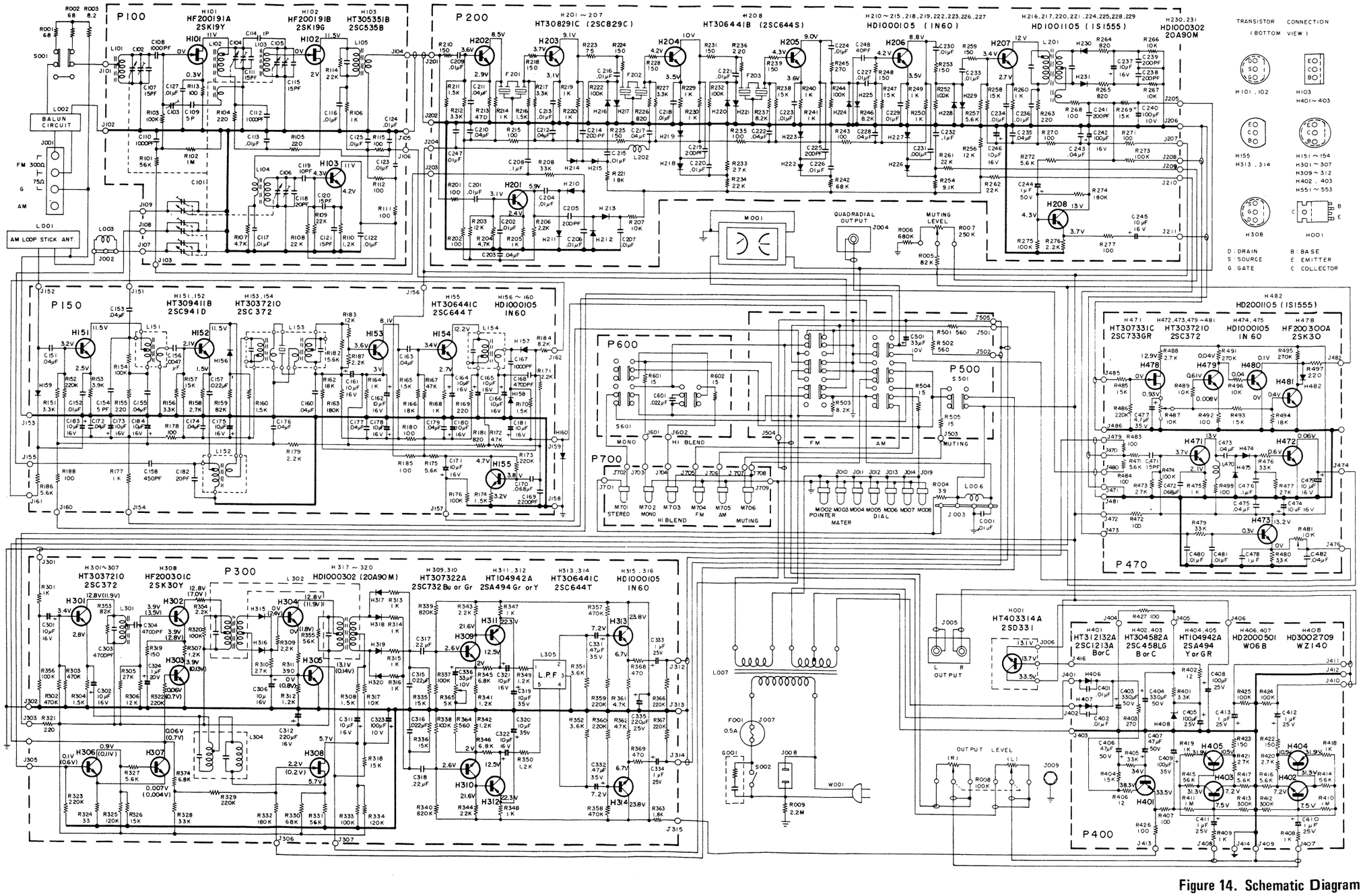

Figure 14. Schematic Diagram

7. PARTS LIST

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
P100	YD2819002	P.C. Board
	ZZ2856102	P.C. Board Ass'y
		RESISTORS
		All resisters are ±5% and ¼W.
R101	RT0556314	56KΩ
R102	RT0510514	1MΩ
R103	RT0510414	100KΩ
R104	RT0522114	220Ω
R105	RT0522114	220Ω
R106	RT0510214	1KΩ
R107	RT0547214	4.7KΩ
R108	RT0522314	22KΩ
R109	RT0522314	22KΩ
R110	RT0512214	1.2KΩ
R111	RT0510114	100Ω
R112	RT0510114	100Ω
R113	RT0510114	100Ω
R114	RT0522314	22KΩ
R115	RT0510114	100Ω
		CAPACITORS
C102	CT1100001	Trimming 1.5 ~ 10PF
C103	CT1100002	Trimming 1.5 ~ 10PF
C104	CT1100001	Trimming 1.5 ~ 10PF
C105	CT1100001	Trimming 1.5 ~ 10PF
C106	CT1100001	Trimming 1.5 ~ 10PF
C107	DD1615001	Ceramic 15PF ± 10%
C108	DK1710201	Ceramic 1000PF ± 20%
C109	DD1105001	Ceramic 5PF ± 0.5PF
C110	DK1710201	Ceramic 1000PF ± 20%
C111	DD1615001	Ceramic 15PF ± 10%
C112	DK1710201	Ceramic 1000PF ± 20%
C113	DK1710301	Ceramic 0.01μF ± 20%
C114	DD1001001	Ceramic 1.0PF ± 0.25PF
C115	DD1615001	Ceramic 15PF ± 10%
C116	DK1710301	Ceramic 0.01μF ± 20%
C117	DK1710301	Ceramic 0.01μF ± 20%
C118	DD1620003	Ceramic 20PF ± 10%
C119	DD1210006	Ceramic 10PF ± 1PF
C120	DD1615003	Ceramic 15PF ± 10%
C121	DD1615003	Ceramic 15PF ± 10%
C122	DK1710301	Ceramic 0.01μF ± 20%
C123	DK1710301	Ceramic 0.01μF ± 20%
C124	DK1710301	Ceramic 0.01μF ± 20%
C125	DK1710301	Ceramic 0.01μF ± 20%
C127	DK1710301	Ceramic 0.01μF ± 20%
		COILS AND TRANSFORMERS
L101	LA1203603	Ant Coil
L102	LA1202604	RF Coil
L103	LA1202605	RF Coil
L104	LO1202603	OSC Coil
L105	LI 1001601	I F T
		SEMICONDUCTORS
H101	HF200191A	Transistor 2SK19Y
H102	HF200191B	Transistor 2SK19G
H103	HT305351B	Transistor 2SC535B
		MISCELLANEOUS
J101	YP1000094	Plug

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
J102	YP1000094	Plug
J103	57271240W	Lug Eyelet
J104	57271240W	Lug Eyelet
J105	57271240W	Lug Eyelet
J106	57271240W	Lug Eyelet
J107	57271240W	Lug Eyelet
J108	57271240W	Lug Eyelet
J109	57221240W	Lug Eyelet
1016	273010903	Shield
L003	LC1332002	Choke Coil 3.3μH
P150	YD2818002	P.C. Board
	ZZ2856112	P.C. Board Ass'y
		RESISTORS
		All resister are ±5% and ¼W.
R151	RT0533214	3.3KΩ
R152	RT0522414	220KΩ
R153	RT0539214	3.9KΩ
R154	RT0510414	100KΩ
R155	RT0522114	220Ω
R156	RT0533214	3.3KΩ
R157	RT0515314	15KΩ
R158	RT0527214	2.7KΩ
R159	RT0582314	82KΩ
R160	RT0515214	1.5KΩ
R162	RT0518314	18KΩ
R163	RT0518414	180KΩ
R164	RT0510214	1KΩ
R165	RT0515214	1.5KΩ
R166	RT0518314	18KΩ
R167	RT0547314	47KΩ
R168	RT0510214	1KΩ
R169	RT0522114	220Ω
R170	RT0515214	1.5KΩ
R171	RT0522214	2.2KΩ
R172	RT0547214	4.7KΩ
R173	RT0522414	220KΩ
R174	RT0515214	1.5KΩ
R175	RT0556214	5.6KΩ
R176	RT0510414	100KΩ
R177	RT0510214	1KΩ
R178	RT0510114	100Ω
R179	RT0522214	2.2KΩ
R180	RT0510114	100Ω
R181	RT0582114	820Ω
R182	RT0556214	5.6KΩ
R183	RT0512314	12KΩ
R184	RT0582214	8.2KΩ
R185	RT0510114	100Ω
R186	RT0556214	5.6KΩ
R187	RT0522214	2.2KΩ
R188	RT0510114	100Ω
		CAPACITORS
C151	DF1740301	Film 0.04μF ± 20%
C152	DF1710301	Film 0.01μF ± 20%
C153	DF1740301	Film 0.04μF ± 20%

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REF. DESIG.	MARANTZ PART NO.	DESCRIPTION		
C154	DD1105001	Ceramic	5PF	± 0.5PF
C155	DF1740301	Film	0.04μF	± 20%
C156	DF1747201	Film	0.0047μF	± 20%
C157	DF1722301	Film	0.022μF	± 20%
C158	DF6545101	Film	450PF	± 5%
C160	DF1740301	Film	0.04μF	± 20%
C161	EA1060169	Electroly	10μF	16V
C162	EA1060169	Electroly	10μF	16V
C163	DF1740301	Film	0.04μF	± 20%
C164	EA1060169	Electroly	10μF	16V
C165	EA1060169	Electroly	10μF	16V
C166	EA1060169	Electroly	10μF	16V
C167	DK1710201	Ceramic	1000PF	± 20%
C168	DF1747201	Film	4700PF	± 20%
C169	DF1722201	Film	2200PF	± 20%
C170	DF1668301	Film	0.068μF	± 10%
C171	EA1060169	Film	10μF	16V
C172	DF1740301	Film	0.04μF	± 20%
C173	EA1060169	Electroly	10μF	16V
C174	DF1740301	Film	0.04μF	± 20%
C175	EA1060169	Electroly	10μF	16V
C176	DF1740301	Film	0.04μF	± 20%
C177	DF1740301	Film	0.04μF	± 20%
C178	EA1060169	Electroly	10μF	16V
C179	DF1740301	Film	0.04μF	± 20%
C180	EA1060169	Electroly	10μF	16V
C181	EA1060169	Electroly	10μF	16V
C182	DD1620001	Ceramic	20PF	±10%
C183	EA1060169	Electroly	10μF	16V
C184	EA1070169	Electroly	10μF	16V
		COILS AND TRANSFORMERS		
L151	LA1001017	RF Coil		
L152	LO1001042	RF Coil		
L153	LI 1028002	I F T		
L153	LI 1028003	I F T		
L154	LI 1001048	I F T		
		SEMICONDUCTORS		
H151	HT309411B	Transistor	2SC941	
H152	HT309411B	Transistor	2SC941	
H153	HT3037210	Transistor	2SC372	
H154	HT3037210	Transistor	2SC372	
H155	HT3064410	Transistor	2SC644T	
H156	HD1000105	Diode	IN60	
H157	HD1000105	Diode	IN60	
H158	HD1000105	Diode	IN60	
H159	HD1000105	Diode	IN60	
H160	HD1000105	Diode	IN60	
		MISCELLANEOUS		
J151	YP1000094	Plug		
J152	YP1000094	Plug		
J154	YP1000094	Plug		
J155	YP1000094	Plug		
J156	YP1000094	Plug		
J157	YP1000094	Plug		
J158	YP1000094	Plug		
J159	YP1000094	Plug		
J160	YP1000094	Plug		
J161	YP1000094	Plug		
J162	YP1000094	Plug		

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
P200	YD2856001	P.C. Board
	ZZ2852101	P.C. Board Ass'y
		RESISTORS
		All resistors are ±5% and ¼W.
R201	RT0510114	100Ω
R202	RT0510114	100Ω
R203	RT0512314	12KΩ
R204	RT0547214	4.7KΩ
R205	RT0510214	1KΩ
R206	RT0522214	2.2KΩ
R207	RT0510314	10KΩ
R208	RT0533314	33KΩ
R210	RT0515114	150Ω
R211	RT0515214	1.5KΩ
R212	RT0533214	3.3KΩ
R213	RT0547114	470Ω
R214	RT0510214	1KΩ
R215	RT0510114	100Ω
R216	RT0515214	1.5KΩ
R217	RT0533214	3.3KΩ
R218	RT0515114	150Ω
R219	RT0510214	1KΩ
R220	RT0510214	1KΩ
R221	RT0518314	18KΩ
R222	RT0510414	100KΩ
R223	RT0575014	75Ω
R224	RT0515114	150Ω
R225	RT0510114	150Ω
R226	RT0582114	820Ω
R227	RT0533214	3.3KΩ
R228	RT0515114	150Ω
R229	RT0510214	1KΩ
R230	RT0510214	1KΩ
R231	RT0515114	150Ω
R232	RT0510414	100KΩ
R233	RT0527314	27KΩ
R234	RT0522314	22KΩ
R235	RT0510114	100Ω
R236	RT0522114	220Ω
R237	RT0582214	8.2KΩ
R238	RT0515314	15KΩ
R239	RT0515114	150Ω
R240	RT0510214	1KΩ
R241	RT0510214	1KΩ
R242	RT0568314	68KΩ
R243	RT0510114	100Ω
R244	RT0510414	100KΩ
R245	RT0527114	270Ω
R246	RT0582214	8.2KΩ
R247	RT0515314	15KΩ
R248	RT0515114	150Ω
R249	RT0510214	1KΩ
R250	RT0510214	1KΩ
R252	RT0510414	100KΩ
R253	RT0515114	150Ω
R254	RT0591214	9.1KΩ
R256	RT0512314	12KΩ
R257	RT0556214	5.6KΩ
R258	RT0515314	1.5KΩ
R259	RT0515114	150Ω

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R260	RT0510214	1KΩ
R261	RT0522314	22KΩ
R262	RT0522314	22KΩ
R263	RT0522114	220Ω
R264	RT0582114	820Ω
R265	RT0582114	820Ω
R266	RT0510314	10KΩ
R267	RT0510314	10KΩ
R268	RT0510114	100Ω
R269	RT0515314	15KΩ
R270	RT0510114	100Ω
R271	RT0517114	100Ω
R272	RT0556214	5.6KΩ
R273	RT0510414	100KΩ
R274	RT0518414	180KΩ
R275	RT0510414	100KΩ
R276	RT0522214	2.2KΩ
R277	RT0510114	100Ω
R278	RT0522214	2.2KΩ
		CAPACITORS
C201	DK1710301	Ceramic 0.01μF ± 20%
C202	DK1710301	Ceramic 0.01μF ± 20%
C203	DK1840302	Ceramic 0.04μF +80% -20%
C204	DK1710301	Ceramic 0.01μF ± 20%
C205	DD1620101	Ceramic 200PF ± 10%
C206	DK1710301	Ceramic 0.01μF ± 20%
C207	DK1710301	Ceramic 0.01μF ± 20%
C208	DK1810402	Ceramic 0.1μF +80% -20%
C209	DK1710301	Ceramic 0.01μF ± 20%
C210	DK1840302	Ceramic 0.04μF +80% -20%
C211	DK1840302	Ceramic 0.04μF +80% -20%
C212	DK1840302	Ceramic 0.04μF +80% -20%
C213	DK1710301	Ceramic 0.01μF ± 20%
C214	DD1620101	Ceramic 200PF ± 10%
C215	DK1710301	Ceramic 0.01μF ± 20%
C216	DK1710301	Ceramic 0.01μF ± 20%
C217	DK1840302	Ceramic 0.04μF +80% -20%
C218	DK1710301	Ceramic 0.01μF ± 20%
C219	DD1620101	Ceramic 200PF ± 10%
C220	DK1710301	Ceramic 0.01μF ± 20%
C221	DK1710301	Ceramic 0.01μF ± 20%
C222	DK1840302	Ceramic 0.04μF +80% -20%
C223	DK1710301	Ceramic 0.01μF ± 20%
C224	DK1710301	Ceramic 0.01μF ± 20%
C225	DD1620101	Ceramic 200PF ± 10%
C226	DK1710301	Ceramic 0.01μF ± 20%
C227	DK1710301	Ceramic 0.01μF ± 20%
C228	DK1840301	Ceramic 0.04μF +80% -20%
C229	DK1710301	Ceramic 0.01μF ± 20%
C230	DK1710301	Ceramic 0.01μF ± 20%
C231	DK1710201	Ceramic 0.001μF ± 20%
C232	DK1810402	Ceramic 0.1μF +80% -20%

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
C233	DK1710301	Ceramic 0.01μF ± 20%
C234	DK1710301	Ceramic 0.01μF ± 20%
C235	DK1840302	Ceramic 0.04μF +80% -20%
C236	DK1710301	Ceramic 0.01μF ± 20%
C237	EA1060169	Electroly 10μF 16V
C238	DD1620101	Ceramic 200PF ± 20%
C239	DD1620101	Ceramic 200PF ± 20%
C240	EA1070109	Electroly 100μF 10V
C241	DD1620101	Ceramic 200PF ± 20%
C242	EA1070169	Electroly 100μF 16V
C243	DK1840302	Ceramic 0.04μF +80% -20%
C244	EA1050509	Electroly 1μF 50V
C245	EA1060169	Electroly 10μF 16V
C246	EA1060169	Electroly 10μF 16V
C247	DK1710301	Ceramic 0.01μF ± 20%
C248	DD1540001	Ceramic 40PF ± 5%
		MISCELLANEOUS
F201	FF1107004	Ceramic Filter CFS10.7M
F202	FF1107004	Ceramic Filter CFS10.7M
F203	FF1107004	Ceramic Filter CFS10.7M
		SEMICONDUCTORS
H201	HT308291C	Transistor 2SC829C
H202	HT308291C	Transistor 2SC829C
H203	HT308291C	Transistor 2SC829C
H204	HT308291C	Transistor 2SC829C
H205	HT308291C	Transistor 2SC829C
H206	HT308291C	Transistor 2SC829C
H207	HT308291C	Transistor 2SC829C
H208	HT306441B	Transistor 2SC644S
H210	HD1000105	Diode 1N60
H211	HD1000105	Diode 1N60
H212	HD1000105	Diode 1N60
H213	HD1000105	Diode 1N60
H214	HD1000105	Diode 1N60
H215	HD1000105	Diode 1N60
H216	HD2001105	Diode 1S1555
H217	HD2001105	Diode 1S1555
H218	HD1000105	Diode 1N60
H219	HD1000105	Diode 1N60
H220	HD2001105	Diode 1S1555
H221	HD2001105	Diode 1S1555
H222	HD1000105	Diode 1N60
H223	HD1000105	Diode 1N60
H224	HD2001105	Diode 1S1555
H225	HD2001105	Diode 1S1555
H226	HD1000105	Diode 1N60
H227	HD1000105	Diode 1N60
H228	HD2001105	Diode 1S1555
H229	HD2001105	Diode 1S1555
H230	HD1000302	Diode 20A90M
H231	HD1000302	Diode 20A90M
		MISCELLANEOUS
L201	LI1401623	I F T FM
L202	LC1332002	Choke Coil 3.3μH
J201	YP1000099	Plug
J202	YP1000099	Plug
J203	YP1000099	Plug
J204	YP1000099	Plug

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REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
J205	YP1000099	Plug
J206	YP1000099	Plug
J207	YP1000099	Plug
J208	YP1000099	Plug
J209	YP1000099	Plug
J210	YP1000099	Plug
J211	YP1000099	Plug
P300	YD2818004	P.C. Board
	ZZ2852104	P.C. Board Ass'y
		RESISTORS
		All resistors are ±5% and ¼W, unless otherwise indicated.
R301	RT0510214	1KΩ
R302	RT0547414	470KΩ
R303	RT0547414	470KΩ
R304	RT0515214	1.5KΩ
R305	RT0527314	27KΩ
R306	RT0512314	12KΩ
R307	RT0512214	1.2KΩ
R308	RT0515214	1.5KΩ
R309	RT0522214	2.2KΩ
R310	RT0527314	27KΩ
R311	RT0539114	390Ω
R312	RT0512214	1.2KΩ
R313	RT0510214	1KΩ
R314	RT0510214	1KΩ
R315	RT0510214	1KΩ
R316	RT0510214	1KΩ
R317	RT0510314	10KΩ
R318	RT0515314	15KΩ
R319	RT0515114	150Ω
R320	RT0510414	100KΩ
R321	RT0522114	220Ω
R322	RT0522414	220KΩ
R323	RT0522414	220KΩ
R324	RT0533014	33Ω
R325	RT0512414	120KΩ
R326	RT0515314	15KΩ
R327	RT0556214	5.6KΩ
R328	RT0533314	33KΩ
R329	RT0522414	220KΩ
R330	RT0568314	68KΩ
R331	RT0556314	56KΩ
R332	RT0518414	180KΩ
R333	RT0510414	100KΩ
R334	RT0512414	120KΩ
R335	RT0515314	15KΩ
R336	RT0515314	15KΩ
R337	RT0510414	100KΩ
R338	RT0510414	100KΩ
R339	RT0582414	820KΩ
R340	RT0582414	820KΩ
R341	RT0512214	1.2KΩ
R342	RT0512214	1.2KΩ
R343	RT0522314	22KΩ
R344	RT0522314	22KΩ
R345	RT0568214	6.8KΩ
R346	RT0568214	6.8KΩ
R347	RT0510214	1KΩ
R348	RT0510214	1KΩ
R349	RT0512214	1.2KΩ

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION		
R350	RT0512214	1.2KΩ		
R351	RT0536214	3.6KΩ		
R352	RT0536214	3.6KΩ		
R353	RT0582314	82KΩ		
R354	RT0522214	2.2KΩ		
R355	RT0556314	56KΩ		
R356	RT0510414	100KΩ		
R357	RT0547414	470KΩ		
R358	RT0547414	470KΩ		
R359	RT0522414	220KΩ		
R360	RT0522414	220KΩ		
R361	RT0547214	4.7KΩ		
R362	RT0547214	4.7KΩ		
R363	RT0518214	1.8KΩ		
R364	RT0556114	560Ω		
R365	RA0502013	5KΩ	(B)	
R366	RT0522414	220KΩ		
R367	RT0522414	220KΩ		
R368	RT0547114	470Ω		
R369	RT0547114	470Ω		
R374	RT0568214	6.8KΩ		
		CAPACITORS		
C301	EA1060169	Electroly	10μF	16V
C302	EA1060169	Electroly	10μF	16V
C303	DF5547203	Film	4700PF	± 5%
C304	DF1647201	Film	4700PF	± 10%
C306	EA1060169	Electroly	10μF	16V
C311	EA1060169	Electroly	10μF	16V
C312	EA2270169	Electroly	220μF	16V
C315	DF1522301	Film	0.022μF	± 5%
C316	DF1522301	Film	0.002μF	± 5%
C317	DF1722401	Film	0.22μF	± 20%
C318	DF1722401	Film	0.22μF	± 20%
C319	EA1060359	Electroly	10μF	35V
C320	EA1060359	Electroly	10μF	35V
C321	EA1060169	Electroly	10μF	16V
C322	EA1060169	Electroly	10μF	16V
C323	EA1070109	Electroly	100μF	10V
C324	EM1040201	Electroly	0.1μF	20V
C331	EA4750359	Electroly	0.47μF	35V
C332	EA4750359	Electroly	0.47μF	35V
C333	EV1050251	Electroly	1μF	25V
C334	EV1050251	Electroly	1μF	25V
C335	EA2270259	Electroly	220μF	25V
C336	EA3360109	Electroly	33μF	10V
		COILS		
L301	LS1001007	MPX	19KHz AMP	
L302	LS1503002	MPX	19.38KHz Block	
L304	LS1503001	MPX	19.67KHz Trap	
L305	LS3501002	MPX	L. P. F.	
		SEMICONDUCTORS		
H301	HT3037210	Transistor	2SC372	
H302	HT3037210	Transistor	2SC372	
H303	HT3037210	Transistor	2SC372	
H304	HT3037210	Transistor	2SC372	
H305	HT3037210	Transistor	2SC372	
H306	HT3037210	Transistor	2SC372	
H307	HT3037210	Transistor	2SC372	

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION		
H308	HF200301C	Transistor	2SK30Y	
H309	HT307322A	Transistor	2SC732	
H310	HT307322A	Transistor	2SC732	
H311	HT104942A	Transistor	2SA494G, Y	
H312	HT104942A	Transistor	2SA494G, Y	
H313	HT3064410	Transistor	2SC644T	
H314	HT3064410	Transistor	2SC644T	
H315	HD1000105	Diode	1N60	
H316	HD1000105	Diode	1N60	
H317	HD1000302	Diode	20A90M	
H318	HD1000302	Diode	20A90M	
H319	HD1000302	Diode	20A90M	
H320	HD1000302	Diode	20A90M	
		MISCELLANEOUS		
J301	YP1000094	Plug		
J302	YP1000094	Plug		
J303	YP1000094	Plug		
J305	YP1000094	Plug		
J306	YP1000094	Plug		
J307	YP1000094	Plug		
J312	YP1000094	Plug		
J313	YP1000094	Plug		
J314	YP1000094	Plug		
J315	YP1000094	Plug		
P400	YD2852001	P.C. Board		
	ZZ2852001	P.C. Board Ass'y		
		RESISTORS **All resistors are ±5% and ¼W, unless otherwise indicated.**		
R401	RC1033212	3.3KΩ	± 10%	½W
R402	RC1012012	12Ω	± 10%	½W
R403	RC1027112	270Ω	± 10%	½W
R404	RC1015312	15KΩ	± 10%	½W
R405	RC1033312	33KΩ	± 10%	½W
R406	RC1012012	12Ω	± 10%	½W
R407	RC1010112	100Ω	± 10%	½W
R408	RT0510214	1KΩ		
R409	RT0510214	1KΩ		
R410	RT0510514	1MΩ		
R411	RT0510514	1MΩ		
R412	RT0530414	300KΩ		
R413	RT0530414	300KΩ		
R414	RT0556314	56KΩ		
R415	RT0556314	56KΩ		
R416	RT0556214	5.6KΩ		
R417	RT0556214	5.6KΩ		
R418	RT0510214	1KΩ		
R419	RT0510214	1KΩ		
R420	RT0527214	2.7KΩ		
R421	RT0527214	2.7KΩ		
R422	RT0515114	150Ω		
R423	RT0515114	150Ω		
R424	RT0510414	100KΩ		
R425	RT0510414	100KΩ		
R426	RC1010112	100Ω	± 10%	½W
R427	GS1010105	100Ω	± 10%	5W
		CAPACITORS		
C401	DK1810351	Ceramic	0.01μF	$^{+100}_{-0}$%

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION		
C402	DK1810351	Ceramic	0.01μF	$^{+100}_{-0}$%
C403	EA3370509	Electroly	330μF	50V
C404	EA3370509	Electroly	330μF	50V
C405	EA1070259	Electroly	100μF	25V
C406	EA4760509	Electroly	47μF	50V
C407	EA4760509	Electroly	47μF	50V
C408	EA1070259	Electroly	100μF	25V
C409	EA1070359	Electroly	100μF	35V
C410	EV1050251	Electroly	1μF	25V
C411	EV1050251	Electroly	1μF	25V
C412	EV1050251	Electroly	1μF	25V
C413	EV1050251	Electroly	1μF	25V
		MISCELLANEOUS		
J401	YP1000099	Plug		
J402	YP1000099	Plug		
J403	YP1000099	Plug		
J404	YP1000099	Plug		
J405	YP1000099	Plug		
J406	YP1000099	Plug		
J407	YP1000099	Plug		
J408	YP1000099	Plug		
J409	YP1000099	Plug		
J410	YP1000099	Plug		
J411	YP1000099	Plug		
J412	YP1000099	Plug		
J413	YP1000099	Plug		
J416	YP1000099	Plug		
		SEMICONDUCTORS		
H401	HT312132A	Transistor	2SC1213A	B C
H402	HT304582A	Transistor	2SC458LG	(D) (C)
H403	HT304582A	Transistor	2SC458LG	(D) (C)
H404	HT104942A	Transistor	2SA494	Y GR
H405	HT104942A	Transistor	2SA494	Y GR
H406	HD2000501	Diode	W06B	
H407	HD2000501	Diode	W06B	
H408	HD3002709	Diode	WZ-140	
P470	YD2856002	P.C. Board		
	ZZ2856002	P.C. Board Ass'y		
		RESISTORS **All resistors are ± 10% and ¼W, unless otherwise indicated.**		
R471	RT0556214	5.6KΩ		
R472	RT0510114	100Ω		
R473	RT0527314	27KΩ		
R474	RT0510414	100KΩ		
R475	RT0510214	1KΩ		
R476	RT0533314	33KΩ		
R477	RT0527314	27KΩ		
R479	RT0533314	33KΩ		
R480	RT0533214	3.3KΩ		
R481	RA0103020	Trimming	10KΩ	
R483	RT0510114	100Ω		
R484	RT0510114	100Ω		
R485	RT0510414	100KΩ		
R486	RT0522414	220KΩ		
R487	RA0103020	Trimming	10KΩ	

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
R488	RT0522214	2.2KΩ
R489	RT0510314	10KΩ
R491	RT0527414	270KΩ
R492	RT0510114	100Ω
R493	RT0515314	15KΩ
R494	RT0518314	18KΩ
R495	RT0527414	270KΩ
R496	RT0510314	10KΩ
R497	RT0522114	220Ω
R498	RT0510114	100Ω
		CAPACITORS
C471	DD1615001	Ceramic 15PF ± 10%
C472	DF1668301	Film 0.068μF ± 10%
C473	DF1740301	Film 0.04μF ± 20%
C474	EA1060169	Electroly 10μF 16V
C475	DK1840302	Ceramic 0.04μF +100% -0%
C476	DK1810402	Ceramic 0.1μF +100% -0%
C477	EA4750359	Electroly 4.7μF 35V
C478	DK1810402	Ceramic 0.1μF +100% -0%
C479	EA1060169	Electroly 10μF 16V
C480	DK1710301	Ceramic 0.01μF ± 20%
C481	DK1710301	Ceramic 0.01μF ± 20%
C482	DK1840302	Ceramic 0.04μF +80% -20%
		MISCELLANEOUS
L470	LC2105001	Choke Coil 1mH
H471	HT307331C	Transistor 2SC733 GR
H472	HT3037210	Transistor 2SC372
H473	HT3037210	Transistor 2SC372
H474	HD1000105	Diode 1N60
H475	HD1000105	Diode 1N60
H478	HF200300A	F E T 2SK30
H479	HT3037210	Transistor 2SC372
H480	HT3037210	Transistor 2SC372
H481	HT3037210	Transistor 2SC372
H482	HD2001105	Diode 1S1555
J470	YP1000094	Plug
J471	YP1000094	Plug
J472	YP1000094	Plug
J473	YP1000094	Plug
J474	YP1000094	Plug
J476	YP1000094	Plug
J479	YP1000094	Plug
J480	YP1000094	Plug
J481	YP1000094	Plug
J482	YP1000094	Plug
J484	YP1000094	Plug
J485	YP1000094	Plug
A	285206340	Escutcheon Ass'y
0103	285206301	Escutcheon
0104	282640101	Frame
0105	285215801	Window
0106	281825905	Bush
0107	285205301	Cover
0303	51122608E	T. H. M. Screw
0403	285216050	Bracket K
0421	285016051	Bracket K
0434	281810701	Sheet

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0506	282616003	Bracket
0507	282616004	Bracket
0513	285020101	Partitioner
0514	282711801	Spacer
0515	281812201	Sticker
0628	257710602	Bearing
0629	141511801	Spacer
0631	51040306A	F. H. M. Screw
0703	51100306A	B.H.M. Screw
0708	51100306A	B.H.M. Screw
0711	51042606S	F.H.M. Screw
0724	51100306A	B.H.M. Screw
0726	54040302N	Spring Washer
0728	51100406A	B.H.M. Screw
0729	51570306B	P.H. Tapt Screw
M001	IM1204502	DC Meter
0409	285205150	Guide K
0412	257726201	Pulley
0413	64002400R	R. G. Ring E
0415	285226250	Pulley K
0502	285227401	Reflector
0503	285327102	Holder
0705	51570306B	P. H. Tapt Screw
0706	51570306B	P. H. Tapt Screw
0707	51100306A	B. H. M. Screw
1304	51570306B	P. H. Tapt Screw
J010	YJ0800013	Socket
M003	IN1008007	Lamp
0429	281827401	Reflector
0430	281827101	Holder
0431	282627101	Holder
0433	281910701	Sheet
0713	51570306B	P. H. Tapt Screw
0714	51570306B	P. H. Tapt Screw
0716	51570306B	P. H. Tapt Screw
0717	51570306B	P. H. Tapt Screw
P700	YD2852004	P. C. Board
	ZZ2852004	P.C. Board Ass'y
		MISCELLANEOUS
M701	IN1012011	Lamp 12V Stereo
M702	IN1006301	Lamp 6.3V Mono
M703	IN1006301	Lamp 6.3V Hi-Blend
M704	IN1006301	Lamp 6.3V FM
M705	IN1006301	Lamp 6.3V AM
M706	IN1006301	Lamp 6.3V Muting
J701	YP1000094	Plug
J702	YP1000094	Plug
J703	YP1000094	Plug
J704	YP1000094	Plug
J705	YP1000094	Plug
J706	YP1000094	Plug
J707	YP1000094	Plug
J708	YP1000094	Plug
J709	YP1000094	Plug

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
J011	YJ0800013	Socket Dial
J012	YJ0800013	Socket Dial
J013	YJ0800013	Socket Dial
J014	YJ0800013	Socket Dial
J019	YJ0800013	Socket Dial
M004	IN1008007	Lamp Dial
M005	IN1008007	Lamp Dial
M006	IN1008007	Lamp Dial
M007	IN1008007	Lamp Dial
M008	IN1008007	Lamp Dial
R005	RT0582314	Resistor 82KΩ ±5% ¼W
R006	RT0568414	Resistor 680KΩ ±5% ¼W
R007	RK0254003	Resistor Variable 250KΩ B
J020	YL0103001	Terminal 3P
P500	YD2852002	P. C. Board
	ZZ2852002	P. C. Board Ass'y
		MISCELLANEOUS
R501	RT0556114	Resistor 560Ω ± 5% ¼W
R502	RT0556114	Resistor 560Ω ± 5% ¼W
R503	RT0582214	Resistor 8.2KΩ ± 5% ¼W
R504	RC1015012	Resistor 15Ω ± 10% ½W
R505	RC1015012	Resistor 15Ω ± 10% ½W
C501	EA3360109	Capacitor Electroly 33μF 10V
S501	SP0603002	Pushswitch FM·AM·Mut
J501	YP1000094	Plug
J502	YP1000094	Plug
J503	YP1000094	Plug
J504	YP1000094	Plug
J505	YP1000094	Plug
1307	62031650W	Lug
P600	YD2852003	P. C. Board
	ZZ2852003	P. C. Board Ass'y
		MISCELLANEOUS
R601	RC1015012	Resistor 15Ω ± 10% ½W
R602	RC1015012	Resistor 15Ω ± 10% ½W
C601	DF1622301	Capacitor Film 0.02μF ±10%
S601	SP 0402003	Pushswitch Mono Hi-Blend
J601	YP1000094	Plug
J602	YP1000094	Plug
S002	SP 0301001	Pushswitch Power
R008	RM0104008	Resistor Variable 100KΩ B

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
B	282610340	Pointer Ass'y
0527	281810301	Pointer
0528	282610301	Pointer
0529	281805301	Cover
M002	IN1008018	Lamp Dial Pointer
C	285200640	String Ass'y
0532	72080802A	String
0533	120225801	Hook
0534	56382540G	Eyelet
D	285227340	Fly Wheel Ass'y
0604	257706302	Escutcheon
0605	257727301	Fly Wheel
0606	285211201	Shaft
0610	53110603E	Hexagon Nut
0611	54040602N	Spring Washer
0612	54020601E	Flat Washer P
0607	285011202	Shaft
0608	54040402N	Spring Washer
0803	285216001	Bracket
0804	285216021	Bracket
0819	145525903	Bush
0820	284906701	Cap
0829	257816010	Bracket
0830	257816011	Bracket
0903	51100308S	B. H. M. Screw
0904	53110303E	Hexagon Nut
0906	51100308S	B. H. M. Screw
0907	53110303E	Hexagon Nut
0912	55060307F	T. R. Rivet
0913	54050300R	T. L. Washer OR
0916	51100306S	B. H. M. Screw
0917	62031650W	Lug
0920	51100306S	B. H. M. Screw
0923	53110403E	Hexagon Nut
0925	54020401E	Flat Washer P
0926	54050400R	T. L. Washer OR
0934	51100306S	B. H. M. Screw
0935	54040302N	Spring Washer
G001	BF1040001	Printed Compo.
L002	LB3007526	Balun Coil FM 75Ω → 300Ω
J001	YT0304002	Terminal Ant
J007	YJ0800012	Socket Fuse Holder
J008	YJ0400018	Socket AC Outlet
J009	YL0301021	Terminal Grand
W001	YC0240010	AC Cord
0811	257816052	Bracket K

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0816	281927103	Holder
0929	51100310S	B. H. M. Screw
0930	53110303E	Hexagon Nut
0931	51100308S	B. H. M. Screw
0932	53110303E	Hexagon Nut
0933	54050300R	T. L. Washer OR
L001	LF1120023	Ant Coil AM
0924	62041760W	Lug
1308	62031650W	Lug
R009	GT0522512	Resistor 2.2MΩ ±5% 1/2W
R001	RC1068012	Resistor 68Ω ±10% 1/2W
R002	RC1068012	Resistor 68Ω ±10% 1/2W
R003	RC1008212	Resistor 8.2Ω ±10% 1/2W
J004	YT0201006	Terminal RCA 1P
J005	YT0202007	Terminal RCA 2P
S001	SS0202017	Slide Switch FM Ant Att
E	281915940	Drum Ass'y
1004	281915901	Drum
1005	71101569M	Spring
1006	51650304D	Set Screw
1134	138200503	Clamper
R004	RC1039012	Resistor 39Ω ±10% 1/2W
C001	DK1710301	Capacitor Ceramic 0.01μF ±20%
L006	LC1332002	Choke Coil 3.3μH
J003	YL0104001	Terminal 4P Lug
J006	YJ0500017	Socket
W002	YW2852001	Wire Materials
W003	YX2852001	Wire Materials
0126	275905701	Leg
0313	51100410A	B. H. M. Screw
0314	54020401A	Flat Washer P
0315	54040402A	Spring Washer
1103	285210550	Chassis K
1111	285216004	Bracket
1114	282610102	Support
1115	282610104	Support

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
1133	273025901	Bush
1203	51570306B	P. H. Tapt Screw
1204	51100306E	P. H. M. Screw
1206	51570306B	P. H. Tapt Screw
1207	51100306S	B. H. M. Screw
1209	51570408B	P. H. Tapt Screw
1210	54020401E	Flat Washer P
1211	54040202N	Spring Washer
1214	51570306B	P. H. Tapt Screw
1215	51570306B	P. H. Tapt Screw
1218	51100306S	B. H. M. Screw
1219	51100306S	B. H. M. Screw
1220	51100306S	B. H. M. Screw
1221	51100306E	B. H. M. Screw
1222	51100306S	B. H. M. Screw
1223	51570306B	P. H. Tapt Screw
1225	59030805P	Fiver Washer
1302	51570306B	P. H. Tapt Screw
1303	51570306B	P. H. Tapt Screw
1305	54050300R	T. L. Washer OR
1311	51100306S	B. H. M. Screw
J002	YL0103001	Terminal 3P Lug
H001	HT403314A	Transistor 2SD331
F001	FS1005007	Fuse 0.6A (UL)
1011	281905102	Guide
1012	51060305E	P. H. M. Screw
C101	CA4330001	Variable
0111	281815401	Knob
0112	282815401	Knob
0116	282625701	Lid
0117	257711803	Spacer
0121	282625702	Lid
0305	51100406S	B. H. M. Screw
0309	51100406S	B. H. M. Screw
0310	54020401S	Flat Washer P
0427	282626901	Protector
0510	285230201	Dial
0516	281912002	Insulator
0616	281810650	Bearing K
0620	51640410D	Set Screw C. P.
0621	54040402N	Spring Washer
0622	53110403E	Hexagon Nut
0624	51100306A	B. H. M. Screw

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
0625	54050300R	T. L. Washer OR
0721	51100306S	B. H. M. Screw
0919	51100306S	B. H. M. Screw

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8. TECHNICAL SPECIFICATIONS

FM SECTION:

Tuning Frequency Range	.88—108 MHz
IHFM Usable Sensitivity	2.3μV
IHFM Selectivity	60dB
Capture Ratio	1.6dB
Image Rejection Ratio at 106MHz	70dB
Signal to Noise Ratio (Mono)	70dB
Signal to Noise Ratio (Stereo)	60dB
Total Harmonic Distortion (Mono)	0.15%
Total Harmonic Distortion (Stereo)	0.3%
Frequency Response (ref. 75μ sec. de-emphasis)	±1dB, 50 Hz—15KHz
Stereo Separation at 1 KHz	42dB

AM SECTION:

Tuning Frequency Range	.535—1605KHz
Usable Sensitivity	20μV
Selectivity	26dB
Image Rejection Ratio	70dB
Signal to Noise Ratio	46dB
Frequency Response, —3dB down	50Hz—4KHz
Total Harmonic Distortion	1%

GENERAL:

Power Requirements		120V AC 50 to 60 Hz
Power Consumption		25 Watts
Dimensions	Panel Width	15-3/8
	Panel Height	5-3/4
	Depth	11-13/16
Weight	Unit alone	17.6 lbs
	Packed for Shipment	30 lbs

*These specifications and exterior designs may be changed for improvement without advance notice.

MODEL 115 SERVICE MANUAL FOR EUROPEAN MARCKET

Included in this service manual are the main chassis component locations (bottom view), schematic diagram, individual parts list and voltage conversion.

On the circuit description, alignment method and repairing hints, refer to the original service manual.

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Schematic Diagram 2, 3

Parts List 4

Voltage Conversion Chart 5

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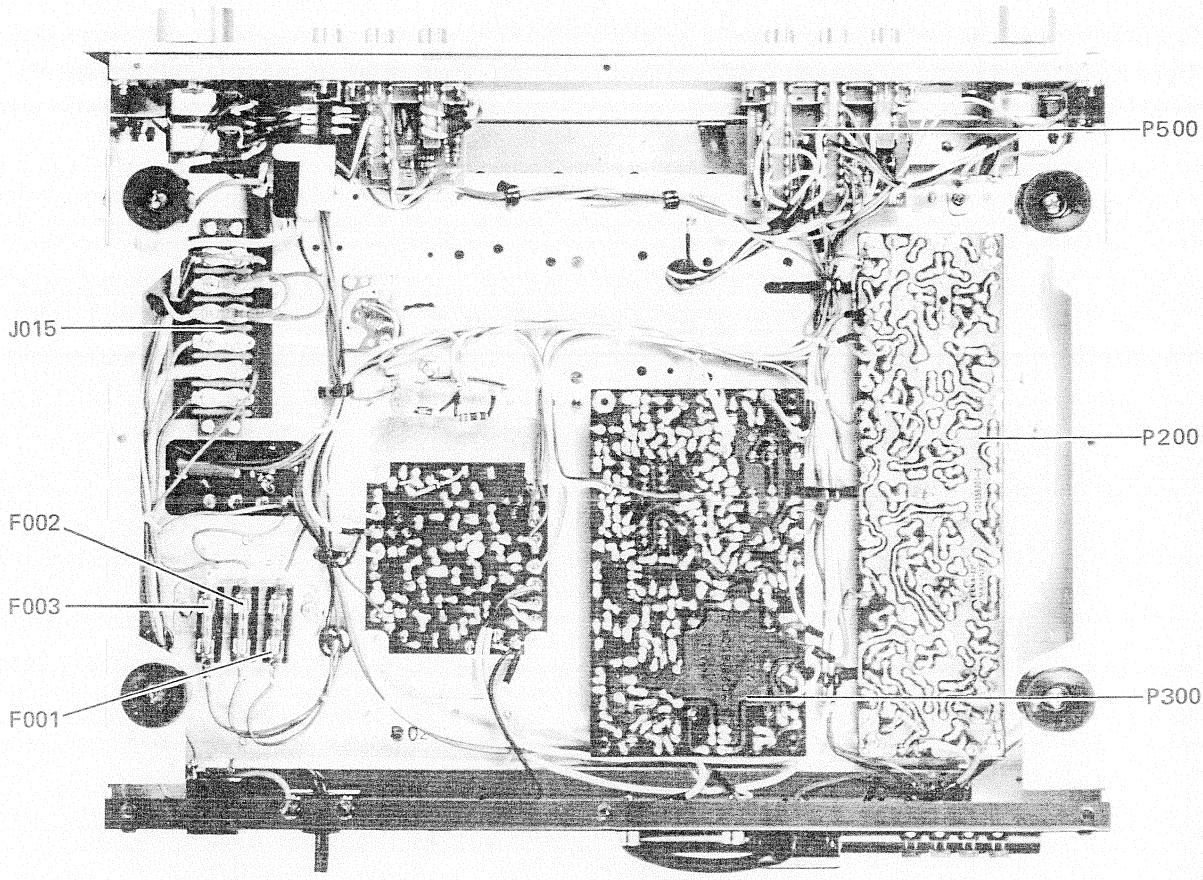


Figure 1. Main Chassis Component Locations (Bottom View)

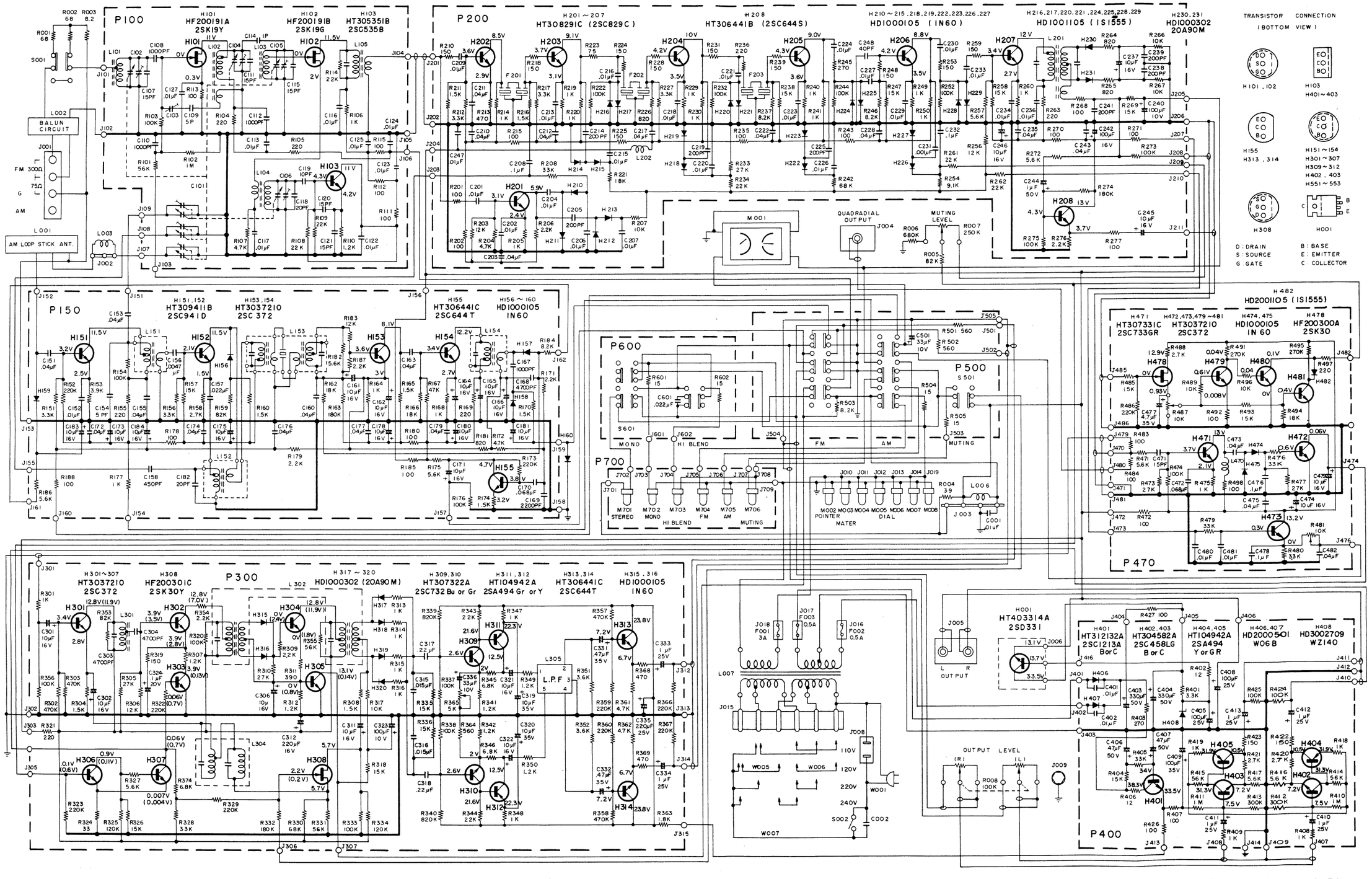


Figure 2. Schematic Diagram

REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
L153	LI1028003	IFT
C315	DF1515301	Capacitor, Film, 0.015μF ±5%
C316	DF1515301	Capacitor, Film, 0.015μF ±5%
C002	DF1756351	Capacitor, Film, 0.056μF 250V
0805	285216022	Bracket
0821	284906702	Cap
0823	282125901	Bush
0824	53110303A	Hexagon Nut x 2
0825	54050300R	T. L. Washer OR x 2
0826	51060316A	P. H. M. Screw x 2
0827	55060305F	T. R. Rivet x 2
1322	54060300R	T. L. Washer IR x 5
J015	YL0106004	Terminal, AC Select
W005	YB0007001	Wire Materials
W006	YB0007001	Wire Materials
W007	YB0027001	Wire Materials
1120	285216006	Bracket
1316	51062606E	P. H. M. Screw x 3
J016	YJ0800009	Socket, Fuse Holder
J017	YJ0800009	Socket, Fuse Holder
J018	YJ0800009	Socket, Fuse Holder
W004	YW2852002	Wire Materials
1119	285412001	Insulator
1318	51570306B	P. H. Tapt Screw x 2
1321	51570312B	P. H. Tapt Screw x 2
L007	TS1600907	Power Transf.
F001	FS1030004	Fuse, 3A
F002	FS1005003	Fuse, 0.5A
F003	FS1005003	Fuse, 0.5A
1524	952301511	Serial NO Card x 4
0204	285226503	Indicator
0233	282726514	Indicator
1404	285285103	Instructions
1411	285285603	Schematic Diagram
1518	956000004	Hang Tag

*** To be used in the European Model only.**

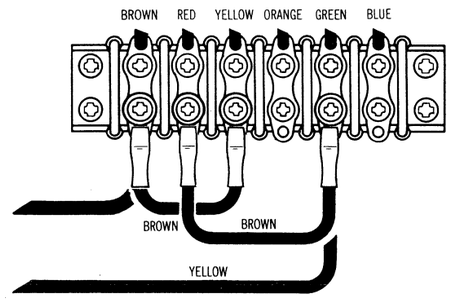
REF. DESIG.	MARANTZ PART NO.	DESCRIPTION
L153	LI1028002	IFT
C315	DF1522301	Capacitor, Film, 0.022μF ±5%
C316	DF1522301	Capacitor, Film, 0.022μF ±5%
0803	285216001	Bracket
0819	145525903	Bush x 2
G001	BF1040001	Printed Compo.
J007	YJ0800012	Socket, Fuse Holder
1308	62031650W	Lug
R009	GT0522512	Resistor, 2.2 MΩ ±5%, ½W
W002	YW2852001	Wire Materials
L007	TS1600905	Power Transf.
F001	FS1005007	Fuse, 0.5A (UL)
1522	952281501	Serial NO Card x 4
0202	285226501	Indicator
1402	285285101	Instructions
1409	285285601	Schematic Diagram

*** To be used in the U.S.A. Model only.**

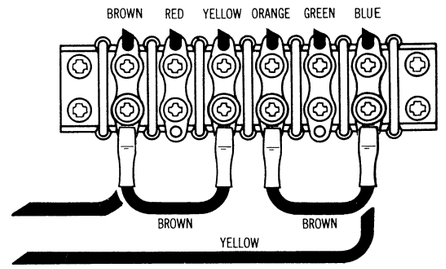
VOLTAGE CONVERSION

This model is equipped with a universal power transformer to permit operation at 110, 120, 220 and 240V AC 50 to 60Hz.
To convert the unit to the required voltage perform the following steps:
(1) Remove the cover.
(2) Change the jumper wires as illustrated below for the required AC voltage.

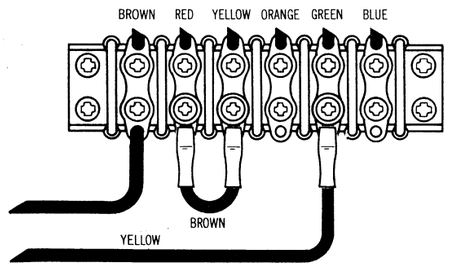
CAUTION: DISCONNECT POWER SUPPLY CORD FROM AC OUTLET BEFORE CONVERTING VOLTAGE.



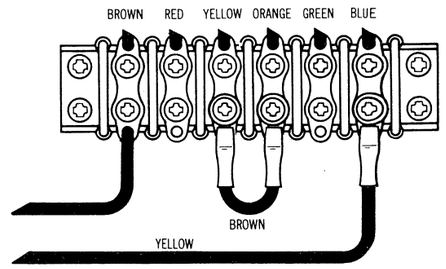
For 110V Operation



For 120V Operation



For 220V Operation



For 240V Operation

Figure 3. Voltage Conversion Chart

2852855020